

CAPC 11464
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TESTING OF SYSTEM FOUR

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I. Prototype Developmental Tests

A. Laboratory tests by the contractor.

1. The tangential sensitivity and the lock-on threshold for CW and pulse signals shall be measured for each receiver.
2. The A.G.C. response curve versus frequency for each super-heterodyne receiver shall be supplied.
3. Antenna patterns for both horizontal and vertical polarizations shall be furnished for all antennas. These patterns are needed in two planes, both perpendicular to the face of the antenna. The first plane is also perpendicular to the longitudinal axis of the plane. The second plane is perpendicular to the first plane. The patterns are needed over 180° in each of the two planes. It is recognized that these patterns should be run with the antennas in place on the vehicle, particularly at the lower frequencies. It will be satisfactory, however, to run these patterns with the antennas mounted in the equipment rack and covered by the radome, provided all antennas are mounted during the test of each antenna. Absolute gains should be shown at the peak of the major lobe of all patterns.
4. The response curves of output versus input should be supplied for each receiver including the recorders for FM, AM and CW modulations at mid-frequency, highest frequency and lowest frequency of each band.
5. Such other tests as the contractor may find necessary for his purposes.

B. Flight tests.

1. At least one signal source within the frequency range of each receiver will be used for flight tests. The power output of this source will be known and its operational pattern will be specified, depending on the capabilities of the source and the receiver to be tested by [] in cooperation with Detachment C and Ramo-Wooldridge personnel. The aircraft will fly at normal altitude and execute the standard back and forth flight path with each leg of the flight progressively farther from the source. The actual distances along each leg of this flight will be set after the capabilities of the sources are

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determined. Due to differences in source powers and operational flexibilities, it is anticipated that three or four flight tests will be necessary to test the complete battery of receivers. Failures, equipment readjustments and unknown factors will probably double or triple this number creating a need for six to twelve flight tests. [] will serve as coordinator and liaison between the contractor, the test source directors and Detachment C.

II. Testing facility required by field service teams.

A. The pre-flight bench check.

1. The test should provide a check on Items 1, 2 and 4 above.
2. Such other tests as deemed necessary by the contractor to insure satisfactory operation of the system.
3. In carrying out Item 4 above, the test should provide a recording on the leader of the tape and on the film to be carried of a pulse signal of known characteristics and amplitude. This signal may be introduced between the antenna and the receiver input terminals. (The gain and pattern data of Item 4 above can then be used to convert this reference signal into field strength necessary to produce a recorded signal of this same amplitude. Dynamic range data of Item 4 above can then be used to compare actual signals-field strengths with this reference signal.)

B. Pre-flight check.

1. A test instrument of fixed frequency signals, at least one signal for each receiver, shall be placed at a pre-determined location in respect to the aircraft and each receiver checked for reception of this signal frequency. Each of these signals should be modulated differently. (The modulation characteristics can then be used as a positive check by the analyst against possible maintenance work that may have changed the tape channel assigned to a given receiver.)